Claims

1. A transmitter for an optical RZ-DPSK communication signal, having a source (1) for an optical carrier, an electro-optical modulator (4), which comprises at least one element (11, 12), the optical path length of which is adapted to be modified by an electrical driver signal (T), for intensity modulating the optical carrier based on the driver signal (T), and a driver circuit (6) for generating the driver signal from an electrical communication signal (DATA), characterized in that the driver signal (T) is an impulse-type signal having two types of impulses spaced in time by a neutral signal state, wherein in presence of the neutral state of the driver signal the transmission of the modulator (4) becomes zero, and the two types of impulses cause a transmission of the modulator (4) which is different from zero and a phase shift which is specific for each type of the impulses.

2. The transmitter of claim 1, characterized in that the specific phase shifts differ by π.

3. The transmitter of claim 1 or 2, characterized in that the electro-optical modulator (4) is an interferometer, in which the optical path length of at least one arm (7, 8) of the interferometer is controllable by the driver signal (T), and the neutral signal level corresponds to a path length difference between arms (7, 8) of half of the carrier wavelength.

4. The transmitter according to one of the preceding claims, characterized in that it comprises two conductors (14a, 14b) for transmitting the driver signal (T), wherein the impulses of the first type are transmitted on a first one (14a) and the impulses of the second type are transmitted on a second one (14b) of the conductors.

5. The transmitter of claim 3 and claim 4, characterized in that the two arms (7, 8) each comprise an element (11, 12) having a controllable optical path length, the first of which is connected to the first conductor and the other of which is connected to the second conductor.

6. The transmitter according to any one of the preceding claims, characterized in that the driver circuit (6) comprises a difference circuit (17, 18) for forming a signal, referred to as pre-coded signal (D), which is representative of the difference between subsequent bits of the electrical communication signal (DATA), and that the driver signal is derived from the pre-coded signal (D).

7. The transmitter of claim 6, characterized in that the difference circuit (17, 18) comprises an XOR-gate (17) and a flip-flop (18).

8. The transmitter according to one of the preceding claims, characterized in that the driver circuit (6) comprises four pairs of switches (T1, T2, ..., T8), each having first and second main ports and a control port, wherein in each pair the first main ports of the switches are connected to each other and the control ports of the switches are supplied with mutually inverse input signals (C, $\overline{C}$, Q, $\overline{Q}$).

9. The transmitter of claim 6, characterized in that in a first and second pair (T5, T7; T6, T8) the second main ports are connected to two output ports (14) of the driver circuit (6), and in a third and fourth pair (T1, T2; T3, T4) one of the second main ports is connected with one of the two output ports (14) and the other second main port is connected to the first main ports of the first and second pair (T5, T7; T6, T8), respectively.

10. The transmitter of claim 6 and claim 9, characterized in that the input signal of the first and second switch pairs (T5, T7; T6, T8) is a clock signal (C, $\overline{C}$), and that the input signal of the third and fourth switch pairs (T1, T2; T3, T4) is the pre-coded signal (D).

11. The transmitter of claim 8, characterized in that in a first, second and third one of the pairs (T5, T7; T6, T8; T3, T4) the second main port is connected to two output ports (14) of the driver circuit (6), and in a fourth one of the pairs (T1, T2) the common first main port is connected to a supply voltage, and each of the second main ports is connected to one of the common first main ports of the first and second pairs (T5, T7; T6, T8), respectively.

12. The transmitter of claim 6 and claim 11, characterized in that the input signal of the first, second and third switch pairs (T5, T7; T6, T8; T3, T4) is the pre-coded signal (D), and that the input signal of the fourth switch pair (T1, T2) is a clock signal (C, $\overline{C}$).

13. The transmitter according to one of the preceding claims, characterized by a control means (19) for varying the ratio between the duration of the impulses and the duration of the neutral state.

14. The transmitter of claim 13, characterized in that the control means is a mono-flop (19) located in a clock line of the driver circuit (6).